GOALS AS IDENTITIES: EXPLORING THE LINK BETWEEN GOAL-CENTRALITY AND EFFORTLESS SELF-CONTROL

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ABSTRACT OF THE THESIS

Goals as identities: Exploring the link between goal-centrality and effortless self-control

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Goal pursuit is often difficult, especially in the face of obstacles and temptations. Previous research has suggested that people are more likely to act in line with their goals when the goals are rooted deeply within the self-concept, or are more "central" to one's identity. Though past research has demonstrated a relationship between goal-centrality and effective goal pursuit, no research to date has tried to manipulate goal-centrality or test its effectiveness during real-time self-control dilemmas. In the domain of health and fitness, the present work manipulates perceptions of goal-centrality and tests the influence of goal-centrality on processes involved in subsequent self-control decisions. I hypothesized that increasing perceptions of goal-centrality would lead to healthier and more automatic self-control decisions. In Study 1, I found that participants in the high-centrality condition made healthier food choices than participants in the low-centrality condition but took longer to make their decisions. In a second correlational study, I tested the relationship between measured goal-centrality and self-control outcomes. Contrary to Study 1, the results suggested goal-centrality led to healthier choices through automaticity in self-control (i.e., faster choice responses). In addition, goal centrality was associated with stronger motivations to approach goals and avoid temptations. Together, this research explores the outcomes and processes linking goal-identification with goal-directed behaviors and reveals conflicting evidence for the role of goal-centrality in processes related to effective self-control.

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INTRODUCTION

In their daily lives, people often encounter temptations that threaten the fulfillment of long-term goals. People trying to eat healthy come upon the dessert table at a party. People trying to save money notice the perfect pair of new shoes. Such situations may bring about a self-control dilemma in which a long-term goal (e.g., to eat healthy or save money) and a short-term temptation (e.g., to indulge in dessert or splurge on shoes) battle for prioritization (Mischel, 1974; Trope & Fishbach, 2000). Critically, the two motives are mutually exclusive; acting on the temptation precludes progress toward the goal and acting in line with the goal involves foregoing the immediate pleasures of the temptation (Fujita, 2011). In this perspective, self-control "success" occurs when a person foregoes the immediate reward in pursuit of the long-term goal (Fishbach & Shen, 2014). In such conflict situations, what factors influence the decision to choose the long-term goal? What drives successful self-control?

A growing body of literature has been exploring factors that contribute to successful self-control during goal pursuit. For example, foundational research on delayed gratification explored factors that affected children's likelihood of refraining from eating a delicious treat in the moment in order to get a greater reward later on. Children who used strategies like distracting themselves or representing the treats in a more abstract way were better able to resist the immediate temptation and wait for the larger reward (Metcalfe & Mischel, 1999; Mischel, 1974; Mischel & Baker, 1975; Mischel, Ebbesen, & Zeiss, 1972; Moore, Mischel, & Zeiss, 1976). More recent research has built on the idea that cognitive strategies aid self-control. For example, smokers who focused on the long-term consequences of smoking (e.g., "I may get cancer") rather than the short-term rewards (e.g., "It tastes good") experienced

reduced cigarette cravings (Kober, Kross, Mischel, Hart, & Ochsner, 2010). Likewise, people who semantically framed temptation refusal in terms of empowered "I don't" statements (e.g., "I don't eat chocolate") versus "I can't" statements (e.g., "I can't eat chocolate") were better able to resist temptations (Patrick & Hagtvedt, 2012).

In addition to explicit processes that require effortful inhibition of impulses, an emerging body of literature also suggests there are more implicit or automatic routes to self-control (Fujita, 2011). For example, one study found that people had faster response times when "pulling" goal-related words toward them and "pushing" temptation-related words away from them and vice versa, suggesting goal-seekers may have automatic behavioral tendencies to approach goals and avoid temptations (Fishbach & Shah, 2006). Other studies have found evidence for perceptual biases that emerge outside of awareness to help protect goals from temptations. For example, one study found that people in committed relationships perceived attractive individuals as less attractive than did single participants, arguably as means to protect the relationship from threatening others (Cole, Trope & Balcetis, 2016). Another demonstrated that dieters with strong goals to eat healthy perceived distances to unhealthy snacks as farther away to help them resist indulging in nearby temptations (Cole, Kline, Macklin & Balcetis, in prep). Together, past research suggests there are both explicit and implicit factors that influence behavior in self-control conflicts.

The current research will add to this growing area of research by exploring a unique self-control strategy that is grounded in the way people internalize their long-term goals. Specifically, in the present research, I explore how *goal-centrality*—making goals feel like a *core* aspect of the self-concept—influences underlying motivations, automaticity in decisions, and active choices during self-control conflicts.

A link between goal-centrality and goal-directed behavior

The term *goal-centrality*[1] refers to the extent to which a person's goals are incorporated as a part of their personal identity (Verplanken & Holland, 2002). Central goals are those that constitute a core component of one's self-definition and thus become closely integrated with a person's identity and core values. Goals that are more central to one's identity hold a higher and more rigid position in the goal-hierarchy and are therefore less easily replaced with alternative options (Rothermund, 2006). Holding a goal central also makes people feel more fulfilled in the three basic psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 2000, Deci & Ryan, 2011; Milyavskaya, Nadolny & Koestner, 2014). Furthermore, when goals are more central, people find more subjective value in engaging in goal-related behaviors (Berkman, Livingston & Kahn, 2015). Notably, the extent to which a goal is perceived as central can vary person-to-person, goal-to-goal. While two people may both indicate having the same goal—e.g., eating healthy—one person may say being a healthy person is a central part of her self-concept, while the other might only say she tries to eat healthy foods. In this example, it is likely that the individual whose identity involves being a healthy person would more consistently choose to eat healthy.

Indeed, in recent years, several lines of research have found support for the idea that people are more likely to engage in goal-consistent behavior when goals are central to the self (e.g., Sheldon & Elliott, 1999; Verplanken & Holland, 2002; Koestner, Powers,

[1] The current literature uses several terms to refer to relatively synonymous concepts related to goal-centrality. Most commonly, *goal-centrality* is often used interchangeably with goal *self-concordance*. Goal self-concordance has been defined as the degree to which people's goals align with their authentic interests and values (Sheldon & Elliot, 1999). The term goal-centrality extends beyond alignment with authentic interests and values to include emphasis on a greater integration with core identity. In order to reference this direct link to the core sense of self, in this thesis I solely use the term *goal-centrality*.

Milyavskaya, Carbonneau & Hope, 2015). In this past work, researchers typically measure the centrality of peoples' existing goals and find that the more central a goal is to a person's identity, the more likely a person is to act in-line with those goals. For example, in one correlational study, the more people indicated that pro-environmental values were central to their identity, the more environmentally-friendly consumer choices they made (Verplanken & Holland, 2002). Relatedly, several studies that assessed the sources of motivation of peoples' weight-loss and academic goals found that people who reported more autonomous motivation and greater goal-centrality made more goal progress (Werner, Milyavskaya, Foxen-Craft & Koestner, 2016). Furthermore, across a variety of goal domains, college students who reported holding more central goals experienced greater goal success (Koestner et al., 2015). This pattern linking goal-centrality to goal-directed outcomes has been replicated across multiple domains, including pro-environmental behaviors (e.g., Steg, Bolderdijk, Keizer & Perlaviciute, 2014), weight-loss (e.g., Koestner, Otis, Powers, Pelletier & Gagnon, 2008), and relationships (e.g., Sheldon & Houser-Marko, 2001). Together, this research has found that when goals are more central to the self, people are more likely to enact goal-directed behaviors.

A specific case for self-control

To date, research exploring the link between goal-centrality and goal-consistent behavior has been defined by broad conceptions of goal pursuit. Yet there are many aspects of goal pursuit and people face unique self-regulatory challenges during each. For example, people must set goals, maintain effective striving towards goals, shield their goals from temptations, and disengage from goals that are unattainable. Indeed, goal pursuit is complex and multifaceted. Does goal-centrality aid self-regulation during all of these stages of goal pursuit? To better understand the specific self-regulatory benefits of goal-centrality, it is important for researchers to begin to explore the role of goal-centrality within specific facets

of goal pursuit. Though research suggests that goal-centrality is related to goal-consistent behaviors, more work is needed to explore *when* centrality influences goal pursuit and *in what ways* it does so. This thesis will specifically focus on the effects of goal-centrality during **self-control conflicts**.

Self-control conflicts are a daily occurrence for goal-holders. One study found that people spend about a quarter of the time they are awake every day experiencing motivational pulls toward behaviors that conflict with their goals (Hofmann, Vohs, & Baumeister, 2012). Moreover, failures of self-control have been called *the* defining problem of modern society, contributing to large-scale societal problems such as obesity, divorce, and drug addiction (Baumeister, Heatherton & Tice, 1994). Indeed, approximately 70% of U.S. adults are overweight or obese (Centers for Disease Control & Prevention [CDC], 2016). Nearly half of all first marriages end in divorce (CDC, 2012). And out of the near 70% of smokers who try to quit, only about 6% of them are successful (CDC, 2011). At the root of many of these societal problems are individual failures in self-control. Self-control conflicts are common and self-control failures can lead to detrimental outcomes. Exploring whether and how goal-centrality affects self-control may ultimately help inform self-regulatory interventions aimed at helping people resist the urge to give in to temptations that threaten goal progress.

How might goal-centrality be helpful in the resolution of self-control conflicts? When individuals are faced with self-control dilemmas, by definition one behavioral option involves acting in a goal-consistent manner while the other involves acting in a goal-*in*consistent way. If the goal at hand is a central aspect of one's identity—a part of who a person *is*—individuals may find it easier to act in line with goals. Indeed, as a general rule, people typically strive to behave in ways that align with their values, goals, and identities (Festinger, 1962; Baumeister, 2010). Moreover, acting in ways that go against one's values or identity can be quite aversive. Years of research on cognitive dissonance theory suggest

that people feel uncomfortable when they behave in ways that conflict with their values (Festinger, 1962; see Cooper, 2007 for review). Thus, when individuals are faced with self-control dilemmas, the notion that a goal represents a core aspect of who they are is likely to influence their behavior to be consistent rather than conflict with their identity. Goal-centrality may influence the extent to which people quickly and effortlessly choose to behave in ways that align with *who they are* and to avoid behaviors that threaten or challenge their identity.

Some recent research does suggest that goal-centrality may be related to how people manage and perceive temptations encountered throughout goal pursuit. For example, people whose goals were more central reported experiencing less temptation in everyday life (Milyavskaya et al., 2015), and experienced less implicit pulls towards temptations (Werner et al., 2016). In the present work, I expand upon this initial work to explore exactly how goal-centrality affects underlying psychological processes related to self-control. Specifically, I test two possible ways that goal-centrality may affect self-control. First, I test whether goal-centrality influences the extent to which self-control is *enacted automatically and effortlessly.* Past research suggests that in general, people who are successful at self-control experience less conflict when presented with temptations and as such, they enact goal-consistent behaviors more automatically (Gillebaart & Ridder, 2015). Second, I test whether goal-centrality influences *motivational drives* to approach goals or avoid temptations. Previous research has shown, across several domains, that successful goal-seekers have automatic behavioral tendencies to approach goals and avoid temptation (Fishbach & Shah, 2006). Thus, the present research seeks to explore how exactly goal-centrality might influence self-control by testing two possible routes to effective self-control: central goals may affect motivational drives and/or the automaticity of behavior.

Manipulating goal-centrality

In past work, the link between goal-centrality and behavior has only been studied as a correlational relationship, such that researchers have measured the centrality of an existing goal and observed its relationship with goal-consistent behaviors. As such, researchers cannot conclude causal directionality from this link. Do more central goals lead people to engage in goal-directed behaviors, or do people who more consistently behave in-line with their goals feel those goals are more a part of who they are? Understanding the causal relationship between centrality and self-control is integral to designing interventions to help people avoid self-control failure. To date, no research has attempted to increase goal-centrality as a self-control strategy. In the present research, I test if goal-centrality is malleable. If people can adjust the extent to which they perceive their goals as central to identity, people may be able to flexibly shift goals to be closer to their core self-concept in order to effectively resist giving in to temptation. In framing goals as identities, options that do not align with that identity may not be considered and self-control may become more effortless.

In considering whether it is possible to manipulate goal-centrality effectively, it is important to be mindful of several factors. First, the extent to which goal-centrality is considered a state or trait characteristic may influence the likelihood that it can be manipulated by researchers. Though some previous research suggests centrality may be somewhat enduring, similar to other types of individual differences, such as "grit" (e.g., Duckworth, Peterson & Kelley 2007), other research explores centrality as a more malleable concept that can vary situationally (e.g., Tadić, Bakker & Oerlemans, 2013). In order to effectively manipulate centrality in a single lab session, I must consider it a malleable state and attempt to shape a situational mindset that focuses on viewing the goal as an identity in that very moment. Though this lab manipulation should work to influence temporary perceptions of state-like centrality, it may wear off over time or in different situations

(Chaplin, John & Goldberg, 1988). Ultimately, goal-centrality would more closely resemble an enduring trait if a more lasting intervention would integrate the mindset of goal-centrality into the self-concept. For example, researchers might train people to internalize their goals and adopt them as identities over time. As the present research is the first attempt to manipulate goal-centrality, I target the state-like characteristics that are malleable, however I note upfront that longitudinal interventions aimed at reframing goals as identities would likely be necessary to produce an enduring, cross-situational, and stable goal internalization (Chaplin, John & Goldberg, 1988).

Furthermore, in manipulating goal-centrality researchers must be mindful of the distinction between goal-centrality and goal success. When goals are more central, they should be perceived as closely aligned with identity, however that does not suggest that individuals have successfully met the goal. Goal-centrality is aligned with motivation and the self-concept rather than an outcome related to goal progress (Burkley et al., 2015). In designing a centrality manipulation in the present studies, I sought to influence perceptions of goal-centrality without tampering with perceptions of goal success.

THE PRESENT RESEARCH

The current research set out to test two unexplored questions in the goal-centrality literature. First, is it possible to induce feelings of goal-centrality? In a Pilot Study, I tested whether I could manipulate people's beliefs about how central a goal is to their self-concept. Second, does increased goal-centrality influence underlying psychological processes that contribute to successful and more automatic self-control? In Study 1, I explored whether manipulating the centrality of people's healthy eating goals leads to stronger motivations to approach healthy and avoid unhealthy foods and/or automaticity (i.e., faster responses) in making goal-consistent choices. In Study 2, I assessed the relationship between individual

differences in goal-centrality and self-control, choice automaticity, and motivations to approach healthy and avoid unhealthy foods.

I specifically tested these questions within the domain of health and fitness as dieting and fitness are goals commonly held by college students (Milyavskaya et al., 2016). Though this research tested these questions in one specific domain, I note upfront that I do not think there is anything specific about this domain that makes it more amenable to these effects than other domains.

PILOT STUDY

To explore whether goal-centrality aids self-control, I first wanted to ensure that it was possible to experimentally influence the centrality of peoples' goals. To do so, I conducted three online studies to test several ways to manipulate people's perceptions of goal-centrality. Though I conducted three online studies testing different manipulations, for the purpose of this thesis I only discuss the manipulation that produced the strongest effects and that I implemented in subsequent studies. See *Appendix A* for all manipulations.

Participants

Participants were 101 Amazon Mechanical Turk workers each compensated $0.40 to participate in an online study about goals. Because I expected the manipulation to be generalizable across different populations, I did not collect individual demographic information like age, sex, or race in this study. However, it should be noted that Mechanical Turk samples are typically about 60% female with a mean age of 32.3 years (Berinsky, Huber & Lenz, 2012). Typically, about 72% of participants identify as White, 7% Black, 6% Hispanic/Latino, 9% list their race as other, and 7% do not indicate their race (Levay, Freese & Druckman, 2016).

Participants were screened for existing health and fitness goals. Participants indicated

the personal importance of a number of items related to health and fitness. The items included 'being fit and healthy,' 'exercising,' and 'eating healthy foods.' These items were disguised amongst filler items such as 'spending money wisely,' and 'being a good friend.' For all items, participants responded on a 1-10 scale, from 1 *(not at all important to me)* to 10 *(extremely important to me).* Only participants who reported holding at least a moderate health and fitness goal were included in the sample. An a-priori criterion for cut-off was set: only participants who indicated greater than four on the importance scale were included. Participants who did not meet this criterion were automatically directed to the end of the survey and no further data was collected.

Procedure

All participants completed a quiz about their health and fitness identity. Participants were randomly assigned to a high-centrality ($N = 50$) or low-centrality ($N = 51$) condition. Between conditions, the quiz differed in two ways.

First, the quiz questions were biased so as to influence participants to respond closer to scale end-points. In the high-centrality condition, the quiz was biased to induce responses that would lead participants to feel that they are healthy people and that health is incorporated into their life. For example, participants responded to the question: "How often do you eat vegetables?" Response options were designed so participants might feel as if they were responding on the healthiest end of the spectrum. Choices ranged from 'never' to 'once per week or more.' In contrast, response options in the low-centrality condition were intended to make participants feel that they are moderately healthy but that health is not a central part of their life. For example, response items on the question about eating vegetables ranged from 'a few times per week' to 'constantly' so that people were likely to respond on the low end of the response scale.

Second, after completing the quiz, participants received bogus feedback about the

results. In the high-centrality condition, participants were told that their health and fitness "Core Value Score" was 92%, indicating that health and fitness is 92% a central part of their identity. In the low-centrality condition, participants were told health and fitness is 14% a part of their identity. Purposefully, the manipulation was twofold—biased quiz and bogus feedback—so that participants' responses to the quiz questions would seemingly align with the feedback they received. Importantly, the quiz feedback was designed to only influence perceptions of goal-centrality without highlighting goal success, ease, or progress. See *Appendices B and C* for full quizzes.

Next, in order to assess whether the manipulation influenced perceptions of goal-centrality, participants responded to a variety of self-report measures that been found to be related to goal-centrality. Participants completed the following scales in random order.

Goal-self overlap. The goal-self overlap scale was used to assess how connected participants felt they were to 'health and fitness.' Participants indicated which image on a series of seven Venn diagrams most closely resembled their relationship to health and fitness (modeled from Aron, Aron & Smollman, 1992; Inclusion of Other in the Self scale). Each Venn diagram depicted two circles, one for "Me" and the other for "Health and Fitness," which varied in closeness and overlap. The images were rated from one to seven, with seven indicating the most overlap between the two circles. See *Appendix D* for depiction of the scale.

Healthy Eating Identity. Participants completed the Healthy Eating Identity Scale (Strachan & Brawley, 2009) to assess their perceptions of their identity as healthy eaters. This nine item scale (α = .88) included questions such as "Healthy eating is a central part of my self-concept," "I consider myself to be a healthy-eater," and "When I describe myself to others, I usually include that I eat healthy." Participants indicated their level of agreement with each statement on a scale from 1 (*strongly disagree)* to 7 (*strongly agree).* Responses to

each item were summed together for an overall Healthy Eating Identity score. See *Appendix D* for full scale.

Exercise Identity Scale. Participants completed the Exercise Identity Scale (Anderson & Cychosz, 1994) to assess their perceptions of their identity as exercisers. This nine-item scale (α = .94) included questions such as "I consider myself an exerciser," "Physical exercise is a central part of my self-concept," and "When I describe myself to others, I usually include my involvement in exercise." Participants indicated their level of agreement with each statement on a scale from 1 (*strongly disagree)* to 7 (*strongly agree).* Responses to each item were summed together for an overall Exercise Identity score.

Regulation of Eating Behaviors Scale. Participants completed a subscale of the Regulation of Eating Behaviors Scale (REBS; modified from Pelletier, Dion, Slovinec-D'Angelo & Reid, 2004) to assess the extent to which participants eat healthy for intrinsic, integrated, and identified sources of motivation. Participants responded to a four-item scale (α = .86) assessing intrinsic, integrated, and identified sources of motivation with items such as "It is fun to eat meals that are good for my health," "I get satisfaction in eating healthy," and "Eating healthy is part of the way I have chosen to live my life." Participants indicated their level of agreement with the statements on a scale of 1 (*strongly disagree)* to 7 (*strongly agree).* Participants' responses to each item were summed together for an overall intrinsic, integrated, and identified motivation score.

Goal self-concordance. Participants completed the Goal Self-Concordance scale (Milyavskaya, Nadolny & Koestner, 2014) to assess the extent to which they feel a sense of autonomy related to pursuing their health and fitness goals. The four scale items assess controlled (external, introjected) and autonomous (identified, intrinsic) reasons for goal pursuit (Sheldon & Elliot, 1999). Each scale item begins with the preface "I strive to be healthy because…" The two autonomous reasons are "I believe it is a very important goal to

have" and "I endorse it freely and value it as part of my identity." The two controlled reasons are "I would feel anxious, guilty or ashamed if I didn't" and "I feel that I ought to strive to eat healthy." Participants indicated their level of agreement from 1 (*strongly disagree)* to 7 (*strongly agree)* on each statement. An overall autonomy score is computed by averaging the intrinsic and identified scores with the reverse of the external and introjected scores.

Ease. Participants responded to items assessing the subjective ease of engaging in goal-directed behaviors (Werner, Milyavskaya, Foxen-Craft & Koestner, 2016). The two-item scale includes "How laborious and taxing does it feel to engage in healthy behaviors?" and "How easy and natural is it for you to work towards your goal to be healthy?" Participants indicated their agreement from 1 (*not at all) to* 10 (*extremely).* Scale responses were summed together for an overall ease score.

Pilot Study Results

To assess whether participants in the high-centrality condition demonstrated significantly greater feelings of goal-centrality than participants in the low-centrality condition, I conducted independent samples t-tests using each of the scales as dependent variables. Participants in the high-centrality condition reported significantly more closeness to 'health and fitness' on the goal-self overlap scale ($M = 4.6$, $SD = 1.37$) than participants in the low-centrality condition ($M = 3.71$, $SD = 1.41$), $t(99) = -3.22$, $p = .002$, $d = .65$. Furthermore, participants in the high-centrality condition scored significantly higher on healthy eating identity ($M = 43.62$, $SD = 9.4$) than participants in the low-centrality condition ($M = 38.7$, $SD = 10.66$), $t(99) = -2.44$, $p = .016$, $d = .49$. Participants in the high-centrality condition also scored significantly higher on the summed intrinsic, integrated, and identified items of the REBS scale ($M = 22.4$, $SD = 3.5$) than participants in the low-centrality condition ($M = 20.11$, $SD = 5.8$), $t(99) = -2.64$, $p = .01$, $d = .53$.

Additionally, participants in the high-centrality condition showed slightly higher

reports of self-concordance (M = 5.02, SD = .96) than participants in the low-centrality condition (M = 4.75, SD = 0.77), though this difference did not reach significance, $t(99)$ = -1.53, p = .13, d = .3. Similarly, participants in the high-centrality condition reported slightly more subjective ease of goal behaviors (M = 10.74, SD = 3.82) than those in the low-centrality condition (M = 9.58, SD = 3.83), though this difference also did not reach significance, $t(99)$ = -1.51, p = .13, d = .3. There was no significant difference between high-centrality (M = 38.34, SD = 13.9) and low-centrality participants' (M = 36.8, SD = 13.6) responses on the exercise identity scale, $t(99)$ = -.56, p = .577, d = .1.

Across the different measures, preliminary evidence suggests that it is possible to manipulate whether people perceive goals as central to their identity. In the next study, I tested whether the manipulation influences underlying processes linked to self-control decisions.

STUDY 1

In Study 1, I tested possible consequences of increasing peoples' perceptions of goal-centrality. Specifically, I explored whether increased goal-centrality affects: 1) implicit motivations to approach healthy foods and avoid unhealthy foods, 2) automaticity when making decisions between healthy and unhealthy options, and 3) the food choices people make. I predicted that increasing goal-centrality would lead to stronger implicit motivations to approach healthy foods and avoid unhealthy foods, more automaticity (i.e., quickness) in decision making, and healthier food choices.

Method

Participants

A total of 270 students with healthy eating goals were recruited from the Rutgers undergraduate research pool and participated in exchange for course credit. Participants were

only invited to participate in the study if they indicated a moderate health and fitness goal using the same criteria as reported in the pilot study. In order to determine an appropriate sample size, I conducted an a priori power analysis using G*Power with an anticipated small to medium effect (approximately $d = .30 – .40$) and ensuring at least 80% power. Three students failed an attention check question that asked participants to report back their quiz scores. Those three participants were excluded from the analyses. The remaining 267 participants were included in the final data set ($M_{age} = 18.9$ years, $SD_{age} = 2.8$, 104 males, 160 females, and three participants did not specify gender).

Procedure

When participants arrived at the lab, they learned they would first complete a computer survey about their attitudes and behaviors and then they would play a series of computer games.

Participants were randomly assigned to either the centrality or control condition. Participants in each condition took the health and fitness quiz as reported in the Pilot Study. Specifically, participants in the high-centrality condition ($N = 135$) took a version of the quiz biased to influence perceptions of high health goal-centrality and received bogus feedback that health and fitness is central to their identity. Participants in the low-centrality condition ($N = 132$) took a version of the quiz biased to influence perceptions of low health goal-centrality and received bogus feedback that health and fitness is important to them but not central to their identity.

Manipulation check. To confirm that the quiz influenced perceptions of goal-centrality, participants next completed a goal-self overlap scale (modeled from Aron, Aron & Smollman, 1992), as well as two additional self-report items: 1) “I consider myself to be a healthy-eater” taken from the Healthy Eating Identity scale (Strachan & Brawley, 2009), and

2) "Eating healthy is part of the way I have chosen to live my life" taken from the Regulation of Eating Behaviors scale (modified from Pelletier et al., 2004).

Next, participants completed the following computer tasks in order.

Food choice task (modeled from van der Laan, de Ridder, Charbonnier, Viergever & Smeets, 2014). Participants completed a binary food choice task designed to assess 1) the automaticity of decision making when choosing between healthy and unhealthy foods, and 2) dieting self-control decisions as measured by healthy vs. unhealthy snack choices. Participants were shown a series of 60 randomly paired food images which each included one healthy (e.g., apple, carrots) and one unhealthy snack (e.g., cookies, cake, chips). See *Appendix E* for full list of stimuli. For each trial, participants were instructed to use computer keys to quickly indicate their preferred choice if both options were readily available for consumption. To encourage realistic choices, participants were told that one of the snacks they selected would be chosen at random for them to eat at the end of the study. All images used in this task were pretested for subjective reports of healthiness, energy content, appeal, and portion size. For each trial, both reaction time and food choice were collected.

Approach/Avoidance Computer Mouse Task (task design modeled from Fishbach & Shah, 2006; used in Cole, Kline, Macklin & Balcetis, in prep). Participants completed a computer mouse approach and avoidance task designed to assess their underlying motivations to avoid unhealthy foods and approach healthy foods. Participants responded to a series of images that depicted either healthy (e.g., carrots, cucumbers, apples) or unhealthy (e.g., cookies, cake, chips) foods. At the beginning of each trial, participants clicked on a fixation cross that appeared at the center of the screen. The fixation cross was then replaced with an image of either a healthy or unhealthy food. Participants were told that if a healthy food was presented they should pull the computer mouse towards them. During these "pull" trials, the images moved towards the bottom of the screen and got bigger, simulating that

participants were getting closer to the foods (i.e., *approaching*). Participants were told that if an unhealthy food was presented, they should push the computer mouse away from them. During these "push" trials, the images moved towards the top of the screen and got smaller, simulating that participants were getting further away from the foods (i.e., *avoiding*). After each trial was completed, there was a 500-ms pause before the next trial. Participants were instructed to respond as quickly and accurately as possible to every image. Each participant completed 10 practice trials followed by 120 total trials (60 healthy, 60 unhealthy, modeled from Fishbach & Shah, 2006). Across the trials, participants' reaction time was recorded.

Lastly, participants responded to demographic questions including age, gender, and race. Participants also responded to open-ended questions that probed for suspicion about the experimental manipulation. Before leaving the lab, participants were allowed to choose one of several snacks in order to maintain consistency with the food-choice task instructions. Participants were thanked, thoroughly debriefed and informed the quiz feedback was bogus.

Study 1 Results

Manipulation Check. Participants in the high-centrality condition reported significantly more goal-self overlap ($M = 4.89$, $SD = 1.2$) than participants in the low-centrality condition ($M = 3.59$, $SD = 1.38$), $t(265) = -8.108$, $p < .001$, $d = .95$. In addition, participants in the high-centrality condition reported significantly more agreement with the statement "I consider myself to be a healthy person" ($M = 5.54$, $SD = 1.04$) than participants in the low-centrality condition ($M = 4.92$, $SD = 1.29$), $t(265) = -4.3$, $p < .001$, $d = .53$. Lastly, participants in the high-centrality condition reported significantly more agreement with the statement "Eating healthy is part of the way I have chosen to live my life" ($M = 5.56$, $SD = 1.19$) than participants in the low-centrality condition ($M = 4.74$, $SD = 1.3$), $t(265) = -5.23$, $p < .001$, $d = .63$. Together, these results confirm that after the bogus quiz feedback,

participants in the high-centrality condition believed their health goal was more central to their identity than participants in the low-centrality condition.

Food choices. A coding error in data collection led to missing data for three participants who were eliminated from the task analysis. In addition, participants whose average reaction time across all trials was greater than three standard deviations above the mean were considered statistical outliers and eliminated from task analysis. Data for the remaining 253 participants is presented for the food choice task.

For each participant, I calculated the total number of healthy and unhealthy foods chosen across all trials of the computer food choice task. Across both conditions, participants selected healthy over unhealthy foods 66% of the time (SD = 19.5%). There was a significant difference between participants in the high-centrality condition (N = 129) and participants in the low-centrality condition (N = 124) in the number of healthy foods chosen. Participants in the high-centrality condition selected a significantly higher percentage of healthy foods (M = 68.8%, SD = 18.6%) than participants in the low-centrality condition (M = 63.6%, SD = 19.6%), $t(251) = -2.12$, $p = .035$, $d = .27$.

Automaticity in decision making. For each participant, I calculated the average time it took to make their food choices across all trials. Across both conditions, participants took an average of 1616ms (SD = 427.7) to make each food choice. Contrary to my predictions, participants in the high-centrality condition took significantly *longer* to make their food choices (M = 1673.5ms, SD = 448.4) than participants in the low-centrality condition (M = 1556.5ms, SD = 398.2), $t(251) = -2.19$, $p = .029$, $d = .28$. Of note, when including statistical outliers, I still found that centrality significantly impacted food choices, however the effects on decision automaticity became marginal rather than statistically significant, $t(262) = -1.76$, $p = .08$, $d = .22$. Overall, however, regardless of condition, there was negative relationship between

healthy food choices and decision speed, such that quicker reaction time was related to healthier food choices, $r(267) = -.3$, $p < .001$. See *Table 1* for zero-order correlations between measures.

Motivation to approach goals and avoid temptations. I first excluded any "incorrect" trials, meaning trials in which the participant response was not aligned with the correct directions to either push or pull (modeled from Fishbach & Shah, 2006). I then calculated an average of each participant's overall reaction time across all trials, each participant's average reaction time for healthy approach ("pull") trials, and each participant's average reaction time unhealthy avoidance ("push") trials. Participants whose average reaction time across all trials was greater than three standard deviations above the mean were considered statistical outliers and eliminated from analysis. The final sample of participants for the approach/avoidance task was 256 (Centrality condition $N = 128$; Control condition $N = 128$).

Across both conditions, the average reaction time for all trials was 776.2ms ($SD = 103.2$). To assess if there were group differences in the speed with which participants responded to healthy and unhealthy trials, I conducted a mixed model ANOVA with condition as the between-subjects variable and trial type (unhealthy or healthy) as the within-subjects variable. There was a significant main effect of condition on reaction time, such that on average, participants in the high-centrality condition were significantly slower to respond ($M = 785.7$ms, $SD = 109.4$) than participants in the low-centrality condition ($M = 758.9$ms, $SD = 95.3$), $F(1,254) = 4.02$, $p = .045$, $d = .26$. There was no main effect of trial type, $F(1,254) = .348$, $p = .50$, and there was no significant interaction between condition and trial type, $F(1,254) = .39$, $p = .50$. When including statistical outliers, I still found that centrality led to significantly slower reaction time on the approach/avoidance task, $F(1,265) = 4.37$, $p = .038$, $d = .26$.

Study 1 Summary and Discussion

The results from Study 1 provide mixed support for my initial hypotheses. As predicted, people induced to believe that health goals were a central part of their identity made healthier choices in a binary food choice task. However, contrary to my predictions, participants in the high-centrality condition exhibited *slower* reaction time in making these choices than participants in the low-centrality condition. This data suggests that participants with more central goals may make slower, rather than quicker, self-control decisions. Furthermore, contrary to my predictions, in an approach/avoidance computer mouse task, participants in the high-centrality condition were slower to both push away (avoid) unhealthy and pull closer (approach) healthy foods than participants in the low-centrality condition. This suggests goal-centrality may lead people to exhibit weaker, rather than stronger, motivations to approach healthy and avoid unhealthy foods.

Combined, these results suggest that goal-centrality leads to healthier choices, but through slower processing rather than through quicker (more effortless) processing as I had initially predicted. Although I initially predicted the opposite pattern of results, when turning to the literature again, there is perhaps a case to be made for why slower processing may be beneficial during self-control decisions. Indeed, self-control failures are often characterized by impulsive decisions and the inability to resist momentary temptations (e.g., Baumeister, 2002; Loewenstein, 1996). In particular when an individual is in a "hot" state, characterized by emotional, and impulsive processing (e.g., hunger), they may succumb to unhealthy to temptations more quickly (Metcalfe & Mischel, 1999). There is evidence that self-control success often requires conscious and deliberate inhibition of responses (Baumeister & Heatherton, 1996). To maximize the likelihood of self-control success to occur, goal-seekers may benefit from being in a "cool" state, characterized by slow and strategic processing of information (Metcalfe & Mischel, 1999). Therefore, one explanation for slower reaction time is that the goal-centrality manipulation may have helped participants think about the

importance of their health goals and thus led them to inhibit impulsivity and spend more time processing their choices.

Alternatively, the slower processing among participants in the high-centrality condition may simply be an artifact of the manipulation. Since this research was the first to manipulate goal-centrality, and the health quiz does not provide feedback that is indicative of participants' *true* health goal centrality, it could have led to unexpected participant responses. For example, participants may have received centrality feedback that did not align with their existing health-related self-perceptions. This incongruency may have impacted performance on the reaction time tasks. In other words, the results from Study 1 may be due to something specific about the manipulation that does not actually reflect a theoretically meaningful pattern. Notably, there was an overall negative relationship between healthy food choices and reaction time, such that when people make choices more quickly they made healthier choices overall. This relationship did not align with the results from the high-centrality condition suggesting slower processing was related to healthy choices, however this pattern does align with my initial hypothesis. To determine if centrality truly leads to slower processing, or if the results were an artifact of the manipulation, I conducted a second study.

STUDY 2

The purpose of Study 2 was to explore two competing hypotheses: 1) As I initially predicted, does goal-centrality lead to decision automaticity and stronger motivations towards goals and away from temptations? Or, 2) As found in Study 1, does goal-centrality lead to slower decision processing and weaker motivations towards goals and away from temptations? In Study 2, I measured—rather than manipulated—goal-centrality and assessed food choices, decision processing time, and approach/avoidance motivations towards healthy and unhealthy foods.

Method

Participants

A total of 185 students with healthy eating goals were recruited from the Rutgers undergraduate research pool for an in-lab study about goals (M_{age} = 18.8 years, SD_{age} = 1.42, 67 males, 118 females). They received course credit for their participation. In order to determine an appropriate sample size, I conducted an a priori power analysis using G*Power ensuring at least 80% power and anticipating small to moderate correlations (r = .2 – .3) aligned with patterns cited in previous research (e.g., Koestner et al., 2008; Sheldon & Houser-Marko, 2001).

Procedure

*Assessment of goal-centrality***.** Participants self-reported their level of health goal-centrality. Since no goal-centrality scale is used consistently in the literature, I included three measures to assess goal-centrality. First, participants completed a single-item goal-self overlap scale from Study 1 (modeled from Aron, Aron & Smollman, 1992). Second, participants completed the nine-item Healthy Eating Identity scale (Strachan & Brawley, 2009), e.g., "I consider myself to be a healthy-eater." Third, participants completed a single-item goal-fusion scale, a pictorial representation to assess the extent to which goals are incorporated into the self (Burkley, Curtis, Burkley & Hatvany, 2015). Together, these 11 items were each standardized and averaged together (α = .91) to create one overall measure of goal-centrality (M = 0.01, SD = .71, range = -1.65–1.73).

Food choice task. As in Study 1, participants completed a binary food choice task designed to assess 1) the automaticity of decision making in choosing between healthy and unhealthy foods, and 2) self-control in making healthy or unhealthy food choices.

Approach/Avoidance Computer Mouse Task. As in Study 1, participants completed the approach and avoidance computer mouse task designed to assess their underlying motivations to avoid unhealthy foods and approach healthy foods. Each participant completed 10 practice trials followed by 60 total trials (30 healthy, 30 unhealthy). With the exception of shortening the number of trials from 120 to 60 in order to minimize participant fatigue, this task was otherwise identical to the approach/avoidance task used in Study 1.

Lastly, participants responded to demographic questions including age, gender, and race. Participants also reported their current mood and level of hunger. Participants responded to open-ended questions that probed for suspicion about the experiment. Before leaving the lab, participants were thoroughly debriefed and thanked.

Study 2 Results

Food choices. Participants whose average reaction time across all trials was greater than three standard deviations above the mean were considered statistical outliers and eliminated from analysis, leaving 184 total participants. Across the full sample, participants selected healthy foods on an average of 66.3% of trials (SD = 19.15).

In the binary food choice task, there was a significant positive correlation between goal-centrality and healthy food choices, $r(182) = .169$, $p = .02$. Specifically, as goal-centrality increased, the percentage of healthy food choices also increased.

Automaticity in decision making. Across the full sample, the average reaction time for all trials was 1538.26ms (SD = 438.2). There was a significant negative correlation between goal-centrality and reaction time in food choices, $r(182) = -.22$, $p = .003$. Specifically, as goal-centrality increased, reaction time to make choices decreased. In other words, participants who naturally had more central goals made quicker decisions in regards to their food choices. Including outliers, there was no change on the reported effects for food choices,

$r(185) = .17$, $p = .019$, or decision automaticity, $r(185) = -.219$, $p = .003$; all results remained statistically significant.

Motivations to approach goals and avoid temptations. I first excluded any "incorrect" trials, meaning trials in which the participant response was not aligned with the correct instructions to either push or pull. I then calculated an average of each participant's overall reaction time across all trials, each participant's average reaction time for healthy approach ("pull") trials, as well as for each participant's average reaction time unhealthy avoidance ("push") trials. Participants whose average reaction time across all trials was greater than three standard deviations above the mean were considered statistical outliers and eliminated from analysis. The final sample of participants for the approach/avoidance task was 182. Across the full sample, the average reaction time for all trials was 865.35 ($SD = 200.3$).

I assessed if there was a relationship between goal-centrality and motivations to approach healthy foods and avoid unhealthy foods. There was a significant negative correlation between goal-centrality and reaction time, such that as goal-centrality increased, participants were quicker to approach healthy and avoid unhealthy foods, $r(180)= -.238$, $p = .001$. I then assessed the relationship separately with approach and avoidance motivations. There was a significant negative correlation between goal-centrality and avoidance ("push") trials, such that as goal-centrality increased, participants were quicker to push away (i.e., avoid) unhealthy foods, $r(180) = -.25$, $p = .001$. There was also a significant negative correlation between goal-centrality and approach ("pull") trials, such that as goal-centrality increased, participants were quicker to pull healthy foods towards them (i.e., seek to approach), $r(180) = -.192$, $p = .01$. These results indicated that participants higher in goal-centrality demonstrated stronger motivations to both approach healthy foods as well as avoid unhealthy foods. See *Table 2* for zero-order correlations between dependent measures.

Study 2 Summary and Discussion

In Study 2, goal-centrality was positively related to healthy food choices in the binary food choice task. Goal-centrality was also related to quicker reaction time in making food choices. Furthermore, in the approach/avoidance computer mouse task, I found that goal-centrality was related to automatic motivations to seek healthy foods and avoid unhealthy foods.

Study 2 was conducted to explore whether goal-centrality leads to automatic and effortless health choices (as initially predicted), or whether goal-centrality leads to careful and calculated health choices (as found in Study 1). The results from Study 2 suggest the former, that individual differences in goal-centrality lead participants to express more healthy choices overall, make more automatic decisions, and have stronger motivations to approach healthy and avoid unhealthy foods.

GENERAL DISCUSSION

Across a variety of domains, goal-centrality has been positively linked to goal-directed behavior (e.g., Sheldon & Elliott, 1999; Verplanken & Holland, 2002; Koestner et al., 2015), however the link has only been studied broadly across all aspects of goal pursuit. This research explored goal-centrality as one possible factor that may influence a specific aspect of goal pursuit: successful self-control. In order to assess the underlying processes and behavioral outcomes that might link goal-centrality with self-control, the present research manipulated goal-centrality to assess decision automaticity, implicit motivations to approach goals and avoid temptations, and health-related self-control decisions.

In Study 1, I manipulated goal-centrality by using a biased quiz and presenting participants with bogus feedback related to the centrality of their health goals. I found that increasing participants' perceptions of their own health goal-centrality led participants to make healthier food choices on a computer food choice task and take longer to do so.

Participants in the high-centrality condition also demonstrated weaker motivations to approach healthy and avoid unhealthy foods than participants in the low-centrality condition.

Though I initially predicted that participants in the high goal-centrality condition would instead be quicker to make food choices, I speculated several reasons for these results. First, perhaps people with more central goals feel health is particularly important to them, which may lead them to make more careful and calculated decisions about health rather than automatic and quick decisions. Impulsivity often characterizes self-control failure, so goal-centrality may be one way to boost the importance that people place on healthy eating to subsequently buffer against impulsive indulgence. Alternatively, the unexpected findings could have simply been a product of the goal-centrality manipulation leading participants to respond in an unexpected manner or not aligned with their natural tendencies. Notably, Study 1 led to uncertainty in whether the centrality manipulation led to slower decision processing. Regardless of condition, the correlational link between food choice and reaction time was negative (i.e., quicker decisions were linked with healthier choices; see Table 1), so I reasoned that quickness aids effective self-control as initially predicted.

Together, the results from Study 1 led to two competing questions: Does goal-centrality actually lead to slower, more calculated, decisions (as found in Study 1), or, does goal-centrality lead to more automatic and effortless decisions (as initially predicted)? In Study 2, I measured, rather than manipulated, goal-centrality and assessed food choices, automaticity, and approach/avoidance motivations.

In Study 2, I found that natural goal-centrality was positively related to healthy food choices and quicker reaction time in making food choices. Goal-centrality was also related to stronger automatic motivations to seek healthy foods and avoid unhealthy foods. The results from Study 2 demonstrated support for my initial hypothesis that goal-centrality is linked with to automatic and effortless self-control. The results also align with previous research

that suggests goal-centrality is linked with people experiencing less pull towards temptation (Milyavskaya et al., 2015; Werner et al., 2016). Furthermore, it supports the notion that people who are generally successful at self-control enact goal behaviors more automatically (Gillebaart & Ridder, 2015). In addition, it is linked with correlational results from Study 1 that found regardless of condition, the correlational link between food choice and reaction time was negative (i.e., quicker decisions were linked with healthier choices; see *Table 1*), so I reasoned that as I initially predicted, quickness aids effective self-control. Importantly, the results from Study 2 were correlational, so they are also subject to the same critique as existing goal-centrality research, such that the direction of causality cannot be determined.

While much research suggests that successful self-control requires effortful inhibition of impulses, there is also evidence that self-control relies on implicit processes (Fujita, 2011). This suggests that motives can operate automatically and indirectly and impact how people manage self-control conflicts. Indeed, if self-control can be influenced by automatic motives to act in-line with goals, I reasoned that assessing decision reaction time and implicit motivation might be two possible implicit process that may predict self-control. Together, this work suggests that decision processing speed is linked with self-control outcomes. In Study 1, I found that manipulating goal-centrality led to slow responses in self-control. In Study 2, I found that individual differences in goal-centrality were linked with quick responses in self-control. Though I did not find consistent support for the role that goal-centrality plays in influencing implicit processes, I did find consistent evidence that implicit processes (as measured via reaction time) may be related. Across both studies, however, correlational links with reaction time (regardless of centrality), suggest that self-control is more effectively served by quickness and automaticity. Future research should seek to replicate and understand this relationship.

A primary contribution of this work was intended to be the first test of whether goal-centrality can be manipulated as an intervention strategy for successful self-control. The results suggest that while the biased quiz and bogus feedback led participants to make healthy food choices, the centrality manipulation is not a valid intervention for real world use. Though it produced differences between groups in Study 1, the follow-up in Study 2 suggests that the centrality manipulation would not be effective at inducing the natural quickness in decision processing of people who truly hold more central goals. A more effective centrality manipulation should be designed to induce automaticity in decision processing as decision quickness was found among participants who are high in goal-centrality.

Moreover, future research should explore alternate methods to influence goal-centrality that provide a more usable take-home strategy. Specifically, researchers should seek to develop interventions that can teach people to reframe their goals as more central aspects of their identity. This would teach people to change their own perceptions of their goals, rather than centrality feedback coming from an external source in a single lab-session. Future research should implement a longitudinal real-world intervention aimed to retrain how people approach their goals and assess the effects of goal-centrality as it influences every day thoughts and behaviors.

Furthermore, while this research explored goal-centrality in the health and fitness domain, it does not ensure that goal-centrality is linked to decision processing and self-control across all goal domains. Future work should seek to replicate and expand these findings across other goal domains (e.g., smoking, academics, relationships) to build broader theoretical and applied support. Future research should also seek to expand these findings and explore the influence of goal-centrality on other facets of goal pursuit such as goal setting, perseverance, and goal disengagement.

A future line of work may also explore the downstream consequences of self-control failure once perceptions of goal-centrality have been effectively increased. Research on self-affirmation (e.g., Steele, 1988; Aronson, Cohen & Nail, 1999; Cohen & Sherman, 2014; see Sherman & Cohen, 2006 for review) would suggest that when people do not act in line with their identities, they may try to recover and re-affirm their identities by enacting identity-consistent behavior. For example, a dieter who is pressured to have cake at a party may then eat healthy the next day to recover confidence in her identity as a dieter. Once a goal is viewed as a central aspect of identity, will goal-inconsistent action be perceived as more threatening? Future research could explore the patterns of goal-consistent and inconsistent behavior observed following a self-control failure. The role of goal-centrality may be used to predict self-affirmation as well as goal-reengagement after self-control failure.

CONCLUSION

Every day, people encounter temptations that threaten to throw their goals off-course. A dieter walks past a bake shop. A student is invited to a party the night before a test. An ex-smoker finds an old pack of cigarettes. The daily decisions people make to forego the bake shop, skip the party, or throw away the cigarettes are influenced by a variety of internal and external factors. Understanding links to successful and unsuccessful self-control is critical for designing effective interventions to help people become more successful self-regulators. Together, this research begins to test whether goal-centrality—believing a goal is a part of who one really *is*–is one way to minimize the lure of temptations and produce more effective self-control.

REFERENCES

Anderson, D. & Cychosz, C. (1994). Development of an exercise identity scale. *Perceptual and Motor Skills*, *78*(3), 747-751.

Aron, A., Aron E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology, 63*, 596-612.

Aronson, J., Cohen, G. L., & Nail, P. R. (1999). Self-affirmation theory: An update and appraisal. In E. Harmon-Jones & J. Mills (Eds.). *Cognitive Dissonance Theory: Revival with Revisions and Controversies* (pp.127-147). Washington, DC: American Psychological Association.

Balcetis, E., Cole, S., & Bisi, A. (2016). Near and nothing to it: Perceived proximity improves exercise by increasing feasibility appraisals. *Motivation Science, 1,* 203-218.

Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). *Losing control: How and why people fail at self-regulation*. Academic Press.

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry, 7*(1), 1-15.

Baumeister, R. F. (2002). Yielding to temptation: Self-control failure, impulsive purchasing, and consumer behavior. *Journal of Consumer Research*, *28*(4), 670-676.

Baumeister, R. F. (2010). The self. In R. F. Baumeister & E.J. Finkel (Eds.), *Advanced Social Psychology: The State of the Science* (pp. 139-175). Oxford University Press.

Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating online labor markets for experimental research: Amazon. com's Mechanical Turk. *Political Analysis*, *20*(3), 351-368.

Berkman, E., Livingson, J. L., & Kahn, L. E. (2015). Finding the 'self' in self-regulation: The Identity-Value Model. *Available at SSRN 2621251*.

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: the self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*(1), 49-59.

Bryan, C. J., Walton, G. M., Rogers, T., & Dweck, C. S. (2011). Motivating voter turnout by invoking the self. *Proceedings of the National Academy of Sciences*, *108*(31), 12653-12656.

Bryan, C. J., Adams, G. S., & Monin, B. (2013). When cheating would make you a cheater: Implicating the self prevents unethical behavior. *Journal of Experimental Psychology: General*, *142*(4), 1001.

Burkley, E., Curtis, J., Burkley, M., & Hatvany, T. (2015). Goal fusion: The integration of goals within the self-concept. *Self and Identity*, *14*(3), 348-368.

Carver, C. S., & Scheier, M. F. (1999). Themes and issues in the self-regulation of behavior. *Advances in Social Cognition*, *12*(1), 1.

Centers for Disease Control and Prevention. (2011). *Morbidity and mortality weekly report*. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6044a2.htm.

Centers for Disease Control and Prevention. (2012). *National health statistics reports*. Retrieved from http://www.cdc.gov/nchs/data/nhsr/nhsr049.pdf**.**

Centers for Disease Control and Prevention. (2016). *Obesity and overweight*. Retrieved from http://www.cdc.gov/nchs/fastats/obesity-overweight.htm.

Chaplin, W. F., John, O. P., & Goldberg, L. R. (1988). Conceptions of states and traits: dimensional attributes with ideals as prototypes. *Journal of Personality and Social Psychology*, *54*(4), 541.

Cohen, G. L., & Sherman, D. K. (2014). The psychology of change: Self-affirmation and social psychological intervention. *Annual Review of Psychology*, *65*, 333-371.

Cole, S., Riccio, M., & Balcetis, E. (2014). Focused and fired up: Narrowed attention produces perceived proximity and increases goal-relevant action. *Motivation and Emotion*, *38*, 815-822.

Cole, S., Trope, Y., & Balcetis, E. (2016). In the eye of the betrothed: Perceptual downgrading of attractive alternative romantic partners. *Personality and Social Psychology Bulletin*, 0146167216646546.

Cooper, J. (2007). *Cognitive dissonance: 50 years of a classic theory*. SAGE.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227-268.

Deci, E. L., & Ryan, R. M. (2011). Self-determination theory. In P. Van Lange, A. Kruglanski & T. Higgins (Eds.) *Handbook of Theories of Social Psychology*, (pp. 416-433). SAGE.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, *92*(6), 1087.

Fishbach, A., & Converse, B. A. (2010). Identifying and battling temptation. *Handbook of Self-Regulation: Research, Theory and Applications*, *2*, 244-260.

Fishbach, A., & Shah, J. Y. (2006). Self-control in action: Implicit dispositions toward goals and away from temptations. *Journal of Personality and Social Psychology*, *90*(5), 820.

Fishbach, A., & Shen, L. (2014). The explicit and implicit ways of overcoming temptation. In J. Sherman, B. Gawronski & Y. Trope (Eds.) *Dual Process Theories of the Social Mind.* New York: Guilford Press.

Festinger, L. (1962). *A theory of cognitive dissonance* (Vol. 2). Stanford University Press.

Fujita, K. (2011). On conceptualizing self-control as more than just the effortful inhibition of impulses. *Personality and Social Psychology Review, 15*(4), 352-366.

Gillebaart, M., & Ridder, D. T. (2015). Effortless self-control: A novel perspective on response conflict strategies in trait self-control. *Social and Personality Psychology Compass*, *9*(2), 88-99.

Gillebaart, M., Schneider, I. K., & De Ridder, D. T. (2015). Effects of trait self-control on response conflict about healthy and unhealthy food. *Journal of Personality*. doi:10.1111/jopy.12219

Ha, O. R., Bruce, A. S., Pruitt, S. W., Smith, T. R., Burkart, D., Cherry, J. B. C., Smith, T. R., Burkart, D., Bruce, J. M. & Lim, S. L. (2016). Healthy eating decisions require efficient dietary self-control in children: A mouse-tracking food decision study. *Appetite*. *105*, 575-581.

Hofmann, W., Baumeister, R. F., Förster, G., & Vohs, K. D. (2012). Everyday temptations: an experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, *102*(6), 1318.

Kober, H., Kross, E. F., Mischel, W., Hart, C. L., & Ochsner, K. N. (2010). Regulation of craving by cognitive strategies in cigarette smokers. *Drug and Alcohol Dependence*, *106*(1), 52-55.

Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality*, *76*(5), 1201-1230.

Koestner, R., Powers, T. A., Milyavskaya, M., Carbonneau, N., & Hope, N. (2015). Goal internalization and persistence as a function of autonomous and directive forms of goal support. *Journal of Personality*, *83*(2), 179-190.

Levay, K. E., Freese, J., & Druckman, J. N. (2016). The demographic and political composition of mechanical turk samples. *SAGE Open, 6*(1), 2158244016636433.

Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes, 65*(3), 272-292.

Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: dynamics of willpower. *Psychological Review*, *106*(1), 3.

Milyavskaya, M., Inzlicht, M., Hope, N., & Koestner, R. (2015). Saying "no" to temptation: Want-to motivation improves self-regulation by reducing temptation rather than by increasing self-control. *Journal of Personality and Social Psychology*, *109*(4), 677.

Milyavskaya, M., Nadolny, D., & Koestner, R. (2014). Where do self-concordant goals come from? The role of domain-specific psychological need satisfaction. *Personality and Social Psychology Bulletin*, *40*(6), 700-711.

Mischel, W. (1974). Processes in delay of gratification. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 7, pp. 249–292). New York: Academic.

Mischel, W., & Baker, N. (1975). Cognitive appraisals and transformations in delay behavior. *Journal of Personality and Social Psychology*, *31*(2), 254.

Mischel, W., Ebbesen, E. B., & Raskoff Zeiss, A. (1972). Cognitive and attentional mechanisms in delay of gratification. *Journal of Personality and Social Psychology*, *21*(2), 204.

Moore, B., Mischel, W., & Zeiss, A. (1976). Comparative effects of the reward stimulus and its cognitive representation in voluntary delay. *Journal of Personality and Social Psychology*, *34*(3), 419.

Patrick, V. M., & Hagtvedt, H. (2012). "I don't" versus "I can't": When empowered refusal motivates goal-directed behavior. *Journal of Consumer Research*, *39*(2), 371-381.

Payne, B. K., Cheng, C. M., Govorun, O., & Stewart, B. D. (2005). An inkblot for attitudes: affect misattribution as implicit measurement. *Journal of Personality and Social Psychology*, *89*(3), 277.

Pelletier, L. G., Dion, S. C., Slovinec-D'Angelo, M., & Reid, R. (2004). Why do you regulate what you eat? Relationships between forms of regulation, eating behaviors, sustained dietary behavior change, and psychological adjustment. *Motivation and Emotion*, *28*(3), 245-277.

Rothermund, K. (2006). Hanging on and letting go in the pursuit of health goals: Psychological mechanisms to cope with a regulatory dilemma. *Self-regulation in Health Behaviour*, 217-241.

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: the self-concordance model. *Journal of Personality and Social Psychology*, *76*(3), 482.

Sheldon, K. M., Elliot, A. J., Ryan, R. M., Chirkov, V., Kim, Y., Wu, C. & Sun, Z. (2004). Self-concordance and subjective well-being in four cultures. *Journal of Cross-cultural Psychology*, *35*(2), 209-223.

Sheldon, K. M., & Houser-Marko, L. (2001). Self-concordance, goal attainment, and the pursuit of happiness: Can there be an upward spiral?. *Journal of Personality and Social Psychology*, *80*(1), 152.

Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology*, *38*, 183-242.

Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. *Advances in Experimental Social Psychology*, *21*, 261-302.

Strachan, S. M., & Brawley, L. R. (2009). Healthy-eater identity and self-efficacy predict healthy eating behavior: A prospective view. *Journal of Health Psychology*, *14*(5), 684-695.

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology*, *38*, 104-115.

Swann Jr, W. B., & Bosson, J. K. (2010). Self and identity. In S. Fiske, D. Gilbert & L. Gardner (Eds.) *Handbook of Social Psychology* (pp. 589-628). Hoboken, NJ: John Wiley & Sons.

Tadić, M., Bakker, A. B., & Oerlemans, W. G. (2013). Work happiness among teachers: A day reconstruction study on the role of self-concordance. *Journal of School Psychology*, *51*(6), 735-750.

Trope, Y., & Fishbach, A. (2000). Counteractive self-control in overcoming temptation. *Journal of Personality and Social Psychology, 79*, 493–506.

van der Laan, L. N., de Ridder, D. T., Charbonnier, L., Viergever, M. A., & Smeets, P. A. (2014). Sweet lies: neural, visual, and behavioral measures reveal a lack of self-control conflict during food choice in weight-concerned women. *Frontiers in Behavioral Neuroscience*, *8*, 184.

Verplanken, B., & Holland, R. W. (2002). Motivated decision making: effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology*, *82*(3), 434.

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Journal of Personality and Social Psychology*, *94*(5), 883.

Vohs, K. D., & Heatherton, T. F. (2000). Self-regulatory failure: A resource-depletion approach. *Psychological Science*, *11*(3), 249-254.

Werner, K. M., Milyavskaya, M., Foxen-Craft, E., & Koestner, R. (2016). Some goals just feel easier: Self-concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences*, *96*, 237-242.

Table 1: Correlations between Study 1 dependent measures

		Healthy food choices	Food choice RT	Approach/Avoid RT
High-centrality (n = 135)	Healthy food choices	--	-.336***	-.12
	Food choice RT	-.336***	--	.354***
	Approach/Avoid RT	-.12	.354***	--
Low-centrality (n = 132)	Healthy food choices	--	-.299**	-.138
	Food choice RT	-.299**	--	.326***
	Approach/Avoid RT	-.138	.326***	--
All participants (n = 267)	Healthy food choices	--	-.3**	-.11
	Food choice RT	-.3***	--	.346***
	Approach/Avoid RT	-.11	.346***	--

*** $p < .001$
** $p < .01$
* $p < .05$

Table 2: Correlations between Study 2 dependent measures

	Healthy food choices	Food choice RT	Approach/Avoid RT
Healthy food choices	--	-.28***	-.026
Food choice RT	-.28***	--	.223**
Approach/Avoid RT	-.026	.223**	--

*** $p < .001$
** $p < .01$
* $p < .05$

Appendix A: Additional manipulations tested in pilot study

1. Short essay:

Centrality manipulation

Essay Question:

Many people would say that being healthy is part of their identity. In other words, living a healthy lifestyle can be a core part of your self-concept. For instance, you may choose to eat healthy foods because you identify as a healthy person. You may exercise because you are a person who values regular fitness.

In a few sentences, please describe why being a healthy and fit person is an important part of your own identity. Please use as much detail as possible in your response.

Control (health focused)

Essay Question:

Performing a certain amount of exercise each week has been shown to reduce the risk of heart disease, prevent the onset of type two diabetes and lead to numerous other positive health outcomes. Additionally, eating a healthy, balanced diet rich in fruits and vegetables has been shown to lead to similar outcomes.

In a few sentences, please describe as much as you know about the health benefits of diet and exercise. Please use as much detail as possible in your response.

Control (general)

Essay Question:

In a few sentences, please describe something interesting you saw on TV, or watched in a movie during the past week. Please use as much detail as possible in your response.

2. Can't / Don't & Want / Should language tweaking manipulation

High-centrality

Today we're going to teach you a new tool that might help you stay healthy.
The name of the strategy is:

The Magic WAND strategy.

WAND stands for **WANT AND DON'T**.

Using the Magic WAND strategy helps you realize that fitness and health are a core part of WHO YOU ARE. This strategy helps you realize that you are fit and healthy person because it's important to YOU, not any one else. Remember that!

Here's how it works:
Whenever you are faced with a decision related to health or fitness, use your Magic WAND. Use these words: **WANT** and **DON'T**!

For example, say:
- I want to eat healthy.
- I want to go to the gym.
- I exercise because I want to.
- I eat healthy because I want to.

- I don't eat cookies.
- I don't skip the gym.
- I don't eat after 9pm.
- I don't order dessert.

Low-centrality

Today we're going to teach you a new strategy that might help you stay healthy.
The name of the strategy is:

The CASH strategy

CASH stands for **CAN'T AND SHOULD**.

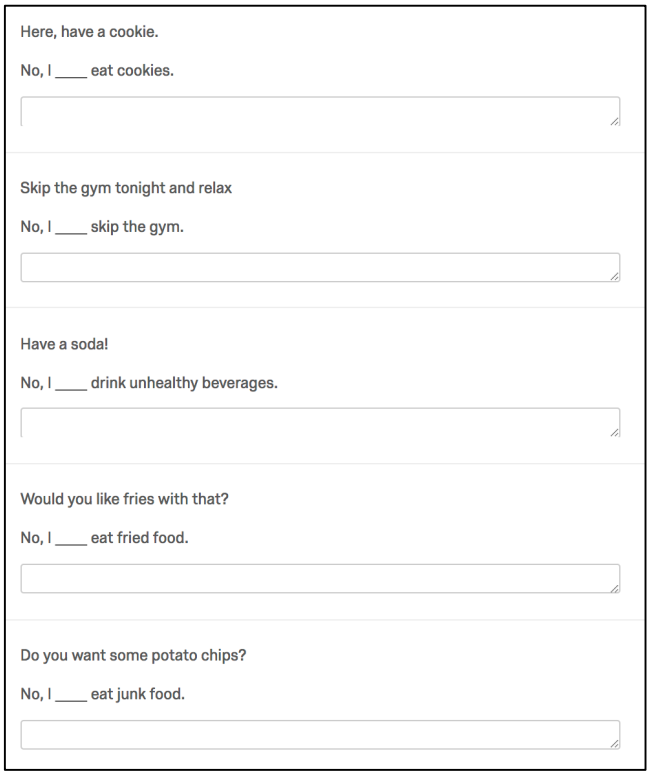
Using the CASH strategy helps you make decisions based on knowing that you SHOULD behave in line with fitness and health standards. This strategy helps you realize that being fit and healthy is important in our society and other people expect you to behave in fit and healthy ways.

Here's how it works:
Whenever you are faced with a decision related to health or fitness, use your CASH. Use these words: **CAN'T** and **SHOULD**.

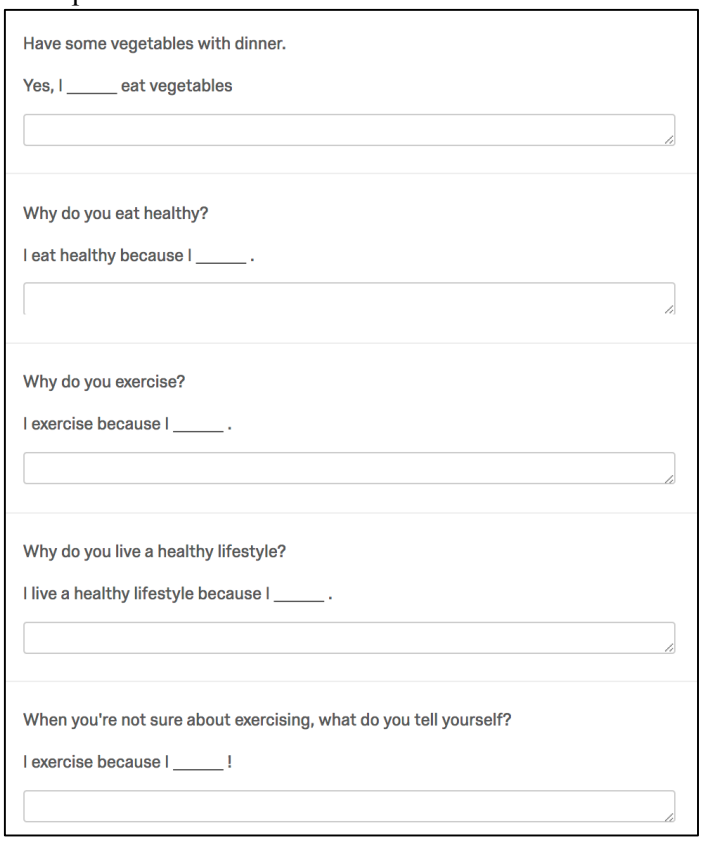
For example, say:
- I can't eat cookies.
- I can't skip the gym.
- I can't eat after 9pm.
- I can't order dessert.

- I should eat healthy.
- I should go to the gym.
- I exercise because I should.
- I eat healthy because I should.

Example "can't" vs. "don't" items



Example “want to” vs. “should” items



Appendix B: Centrality condition quiz and feedback

Healthy Living Quiz

Please respond to the following questions.

How often do you eat vegetables?

- ○ Never
- ○ Rarely
- ○ Once a month
- ○ Once every few weeks
- ○ Once per week or more

How often do you eat fruit?

- ○ Never
- ○ Rarely
- ○ Once a month
- ○ Once every few weeks
- ○ Once per week or more

Please rank the following list in order of IMPORTANCE to your core values. In other words, put the most important item at the top of the list, and the least important item at the bottom of the list.

You may drag and drop the items to move them.

Movies

Shopping

Recycling

Reading Books

Health and Fitness

Please complete this sentence.

Being healthy is part of who I am because _____.

Please indicate how much you agree with the following statements.

	Completely Agree	Mostly Agree	Somewhat Agree	Unsure	Disagree
Eating healthy is important.	○	○	○	○	○
I feel good and proud when I make healthy decisions.	○	○	○	○	○
I would recommend eating healthy and exercising.	○	○	○	○	○
I am in charge of my own behavior.	○	○	○	○	○

Choose the correct answer:

What should you avoid eating in order to be healthy?

- ○ Fiber
- ○ Sugar
- ○ Protein
- ○ Vitamin C
- ○ Vegetables

Choose the correct answer:

Which of the following are the most important part of a balanced, nutritious diet?

- ○ Sweets
- ○ Grains
- ○ Salty Foods
- ○ Red Meat
- ○ Fruits and Veggies

Choose the correct answer:

Which of the following would be the most helpful for someone to lose weight?

- ○ Engage in regular cardio exercise and maintain a healthy diet
- ○ Sleep over 12 hours per night
- ○ Watch educational TV every day
- ○ Go for a short walk once a week
- ○ Go outside more

Please drag and drop each of the following activities to indicate if you have or have not done them at some point in your life:

Items	Have done	Have not done
Gone for a jog		
Exercised in a gym		
Gone hiking		
Walked a mile in a single day		
Gone swimming		
Biked for over ten minutes a single day		
Eaten fruit for snack		

The computer is now compiling your responses from Part 1 and Part 2 of the Healthy Living Quiz to calculate an overall Health and Fitness CORE VALUE SCORE.

Heres how the Core Value Score is calculated:

- **From Part 1 of the quiz, the computer will average your reaction times to the "healthy" and "unhealthy" words in connection with your identity. This is important because automatic reactions to goal-related words have been shown to be a strong indicator of goal connection.**
- **From Part 2 of the quiz, the computer will assess your response patterns in regards to healthy behaviors and beliefs.**

Together, your overall Core Value Score will indicate the extent to which healthy living is a part of your personal identity. Regardless of peoples' goals to eat healthy, some people identify strongly with their goals, others do not.

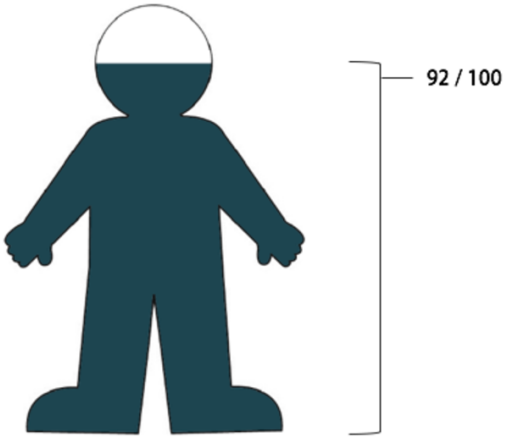
Please wait while the system calculates your Health and Fitness CORE VALUE SCORE...

Health and Fitness Core Value Score: 92 / 100

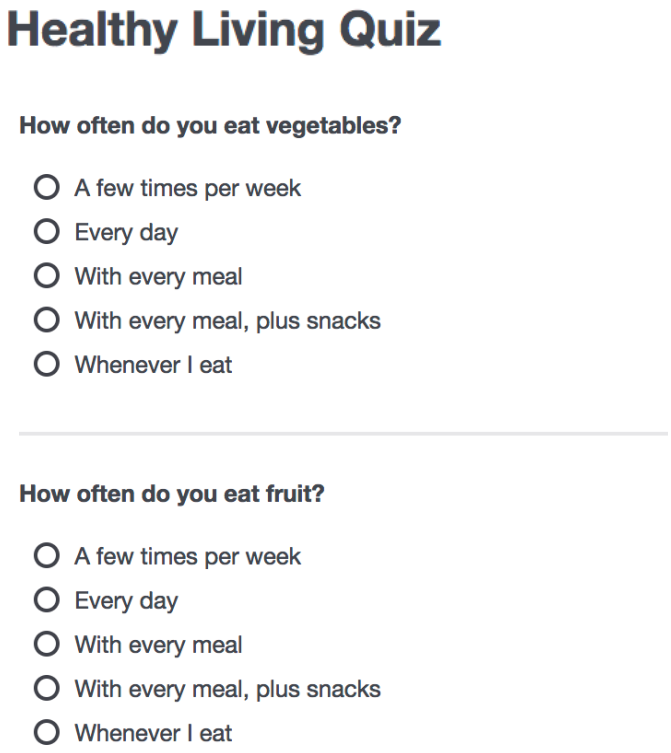
Your score indicates that health and fitness is a very large part of your identity.

You identify strongly as a healthy person. You showed strong automatic associations between yourself and health. This means being healthy is very important to you and you value health more than most people. You know a great deal about being healthy and you often choose healthy behaviors. You choose healthy behaviors because it is important to who you are.

You embrace health and fitness as part of your identity and your lifestyle!



Appendix C: Control condition quiz and feedback



Please rank the following list in order of IMPORTANCE to your core values. In other words, put the most important item at the top of the list, and the least important item at the bottom of the list.

You may drag and drop the items to move them.

Family and friends

Being a good person

Saving money/Spending money wisely

Religion/Spirituality

Eating healthy

Doing well professionally at work or school

Please list several activities that people might do if they want to behave in healthy ways.

1

2

3

4

Please indicate how much you agree with the following statements.

	Completely Agree	Mostly Agree	Somewhat Agree	Unsure	Disagree
Eating healthy feels required.	○	○	○	○	○
Family and friends expect me to be healthy.	○	○	○	○	○
Doctors recommend eating healthy and exercising.	○	○	○	○	○
I should exercise more.	○	○	○	○	○

Choose the correct answer:

How many minutes of exercise does the FDA recommend each week?

- ○ 30 Minutes
- ○ 45 Minutes
- ○ 200 Minutes
- ○ 150 Minutes
- ○ 90 Minutes

Choose the correct answer:

What is the advised fat percentage for an adult aged 18-25?

- ○ <1 %
- ○ 1-2 %
- ○ 2-5 %
- ○ 5-12 %
- ○ 12-20 %

Choose the correct answer:

How many units of Vitamin D are recommended to be consumed daily for an adult 18-50 years old?

- ○ 1200
- ○ 600
- ○ 400
- ○ 1000
- ○ 100

Please drag and drop each of the following activities to indicate if you have or have not done them at some point in your life:

Items	Have done	Have not done
Run a marathon		
Participated in a triathalon		
Run a 5K		
Swam a distance of over one mile in a day		
Biked a distance greater than 100 miles at a single time		
Hiked over 20 Miles in one Day		

The computer is now compiling your responses from Part 1 and Part 2 of the Healthy Living Quiz to calculate an overall Health and Fitness CORE VALUE SCORE.

Heres how the Core Value Score is calculated:

- **From Part 1 of the quiz, the computer will average your reaction times to the "healthy" and "unhealthy" words in connection with your identity. This is important because automatic reactions to goal-related words have been shown to be a strong indicator of goal connection.**
- **From Part 2 of the quiz, the computer will assess your response patterns in regards to healthy behaviors and beliefs.**

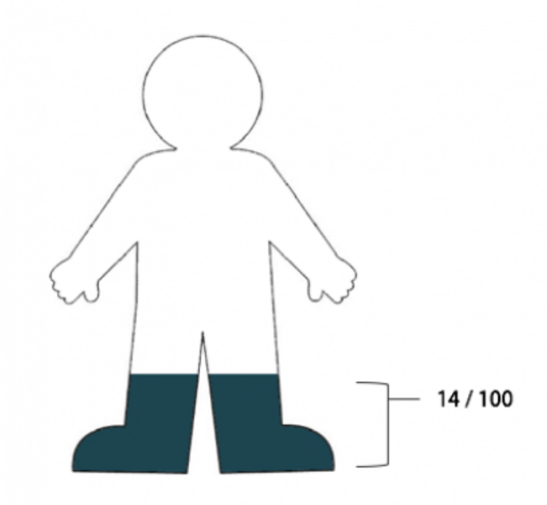
Together, your overall Core Value Score will indicate the extent to which healthy living is a part of your personal identity. Regardless of peoples' goals to eat healthy, some people identify strongly with their goals, others do not.

Please wait while the system calculates your Health and Fitness CORE VALUE SCORE...

Your Health and Fitness Core Value Score: 14 / 100

Your score indicates that health and fitness is a small part of your identity.

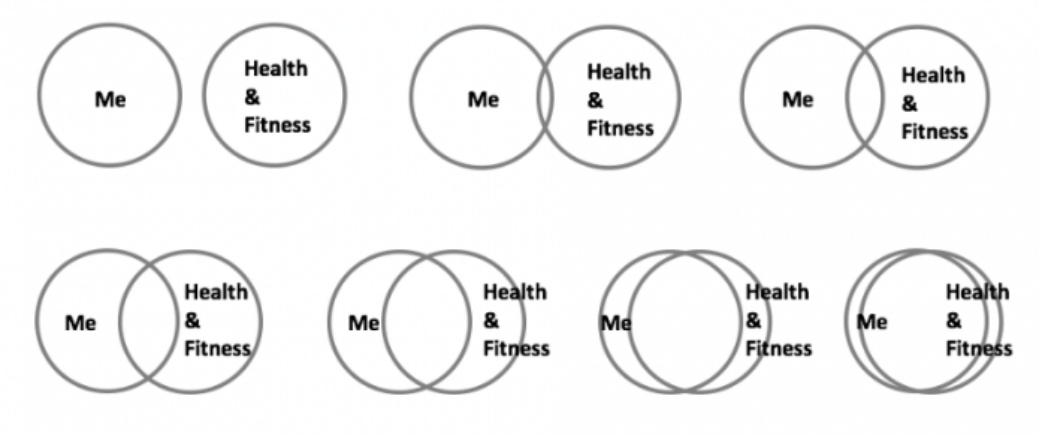
You do not identify strongly as a healthy person. You showed weak automatic associations between yourself and health. This means, you likely think being healthy is important, but you don't view health as part of your identity, and you do not value health more than most people. You likely know some things about being healthy and you engage in some healthy activities. Sometimes you may choose healthy behaviors even if you don't really want to.



Appendix D: Centrality Scales

Goal-self overlap scale (adapted from Aron, Aron & Smollman, 1992; Inclusion of Other in the Self Scale)

Please select the image which best represents your relationship with health and fitness.



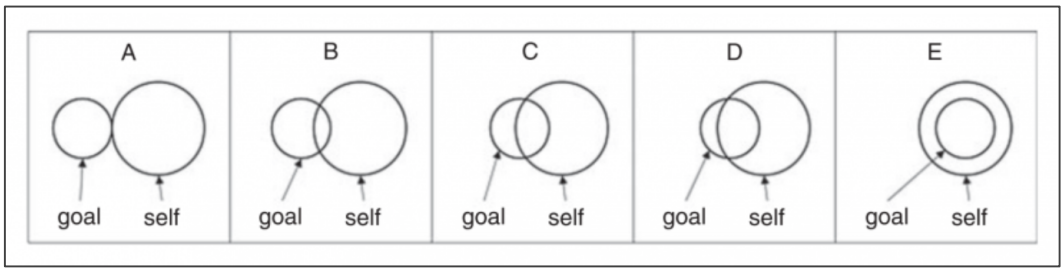
Health Identity scale (Strachan & Brawley, 2009)

Please indicate the extent to which you agree with the following statements from 1 (strongly disagree) to 7 (strongly agree).

	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
I consider myself to be a healthy-eater.	○	○	○	○	○	○	○
Eating healthy is part of the way I have chosen to live my life.	○	○	○	○	○	○	○
When I describe myself to others, I usually include that I eat healthy.	○	○	○	○	○	○	○
I have numerous goals relating to healthy-eating.	○	○	○	○	○	○	○
Healthy eating is important to my self-concept.	○	○	○	○	○	○	○
Others see me as someone who eats healthy.	○	○	○	○	○	○	○
For me, living a healthy lifestyle means more than just eating healthy.	○	○	○	○	○	○	○
I would feel a real loss if I were forced to give up eating healthy.	○	○	○	○	○	○	○
Eating healthy is something I think about often.	○	○	○	○	○	○	○

Goal fusion scale (Burkley, Curtis, Burkley & Hatvany, 2015)

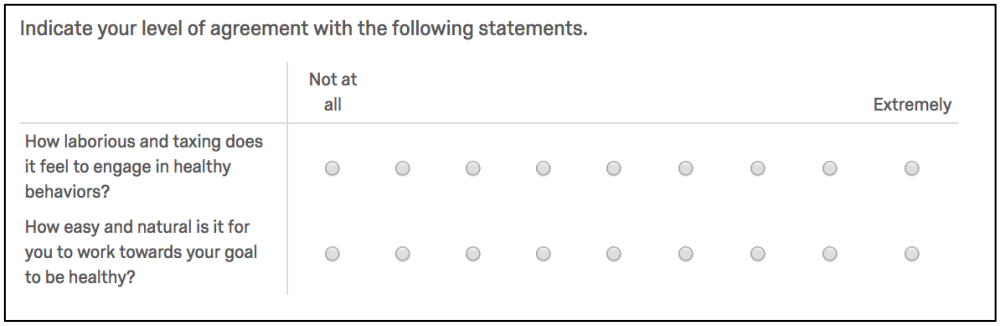
Sometimes it feels like the goals we are pursuing are a part of who we are, that they are included in our self. **With the goal of being healthy in mind,** please select the picture that best represents how much this goal is included in yourself or a part of who you are.



Goal self-concordance scale (Milyavskaya, Nadolny & Koestner, 2014)

	Strongly disagree						Strongly agree
I strive to be healthy because somebody else wants me to, or because I'll get something from somebody if I do.	○	○	○	○	○	○	○
I strive to be healthy because I would feel anxious, guilty or ashamed if I didn't. I feel that I ought to strive to eat healthy.	○	○	○	○	○	○	○
I strive to be healthy because I believe it is a very important goal to have - I endorse it freely and value it wholeheartedly.	○	○	○	○	○	○	○
I strive to be healthy because of the fun and enjoyment that it provides me - the primary reason is simply my interest in the experience itself.	○	○	○	○	○	○	○
I strive to be healthy because it's an important core value - It's part of who I am as a person.	○	○	○	○	○	○	○

Ease scale (Werner, Milyavskaya, Foxen-Craft & Koestner, 2016)



Regulation of Eating Behaviors Scale (modified from Pelletier, et al, 2004)

Indicate the extent to which you agree or disagree with the following statements.

	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
It is fun to eat meals that are good for my health.	○	○	○	○	○	○	○
I get satisfaction in eating healthy.	○	○	○	○	○	○	○
Eating healthy is part of the way I have chosen to live my life.	○	○	○	○	○	○	○
Eating healthy makes me feel better about myself in general.	○	○	○	○	○	○	○
I would feel ashamed of myself if I was not eating healthy.	○	○	○	○	○	○	○
	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
I am embarrassed when I can't control my eating behaviors.	○	○	○	○	○	○	○
Other people close to me insist that I eat healthy.	○	○	○	○	○	○	○
Being healthy is expected.	○	○	○	○	○	○	○
Perhaps I'm wasting my time trying to regulate my eating behaviors.	○	○	○	○	○	○	○
I don't know why I bother to eat healthy.	○	○	○	○	○	○	○

Appendix E: Food choice task items

(randomly paired for each trial)

Healthy Images	Unhealthy Images
1. Fruit cup 1 2. Fruit cup 2 3. Cantaloupe 4. Orange slices 5. Carrots and hummus 6. Veggies and dip 7. Green apple 8. Granola bar 9. Fruit and yogurt 10. Yogurt 11. Nuts 12. Banana 13. Raspberries 14. Peppers 15. Red apple 16. Water 17. Water 2 18. Carrots 2 19. Granola bar 2 20. Grapes 21. Banana chips 22. Strawberries 23. Veggies 24. Granola bites 25. Blueberries	1. Donut 2. Cookie 3. Cake slice 4. Fries 5. Cheese puffs 6. Chips 7. Gummies 8. Chocolate bar 9. Popsicle 10. Oreo cookies 11. Ice cream sandwich 12. Chips 2 13. Licorice 14. Rice krispies treat 15. Cupcake 16. Soda 17. Soda 2 18. Cupcake 2 19. Candy 20. Muffin 21. Caramel popcorn 22. Milkshake 23. Pastry 24. Cookies 25. Chips 3